**Lesson 9.1**

**Problem: 3  Set: Exercises  Page: 192**

Look in your textbook for this problem statement.

Hint

Determine the values of *x* for which the denominator is 0.

Step 1

Determine the values of *x* for which the denominator is 0.

So, factor the denominator.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_3_557/image006.gif

Hint

Use the Zero Product Property.

Step 2

Use the Zero Product Property.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_3_557/image007.gifif *x* = 7 or *x* = –4.

Therefore, the denominator is 0 for *x* = 7 and *x* = –4.

Hint

Conclude.

Step 3

The function is undefined for *x* = 7 and *x* = –4.

The correct answer is D.

**Problem: 45  Set: Exercises  Page: 193**

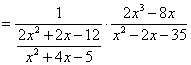
Look in your textbook for this problem statement.

Hint

Use the definition of a negative exponent.

Step 1

Use the definition of a negative exponent.

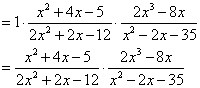


Hint

To divide, multiply by the reciprocal.

Step 2

To divide, multiply by the reciprocal of the divisor.



Hint

Factor.

Step 3

Factor the numerators and the denominators.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_45_559/image106.gif

Hint

Divide out common factors.

Step 4

Divide out common factors.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_45_559/image107.gif

Hint

Simplify.

Step 5

Simplify.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_45_559/image108.gif

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_45_559/image109.gif

**Problem: 49  Set: Exercises  Page: 193**

Look in your textbook for this problem statement.

Hint

Write as a division expression.

Step 1

Write as a division expression.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_49_559/image118.gif

Hint

To divide, multiply by the reciprocal.

Step 2

To divide, multiply by the reciprocal of the divisor.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_49_559/image119.gif

Hint

Factor.

Step 3

Factor the numerators and the denominators.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_49_559/image120.gif

Hint

Divide out common factors.

Step 4

Divide out common factors.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_49_559/image121.gif

Hint

Simplify.

Step 5

Simplify.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_49_559/image122.gif

Multiply the numerators and multiply the denominators.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_49_559/image123.gif

**Problem: 51  Set: Exercises  Page: 193**

Look in your textbook for this problem statement.

Hint

Write as a division expression.

Step 1

Write as a division expression.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_51_559/image125.gif

Hint

To divide, multiply by the reciprocal.

Step 2

To divide, multiply by the reciprocal of the divisor.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_51_559/image126.gif

Hint

Factor.

Step 3

Factor the numerators and the denominators.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_51_559/image127.gif

Hint

Divide out common factors.

Step 4

Divide out common factors.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_51_559/image128.gif

Hint

Simplify.

Step 5

Simplify.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_51_559/image129.gif

Multiply the numerators and multiply the denominators.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_51_559/image130.gif

**Problem: 53  Set: Exercises  Page: 193**

Look in your textbook for this problem statement.

Hint

To divide, multiply by the reciprocal.

Step 1

To divide, multiply by the reciprocal of the divisor.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_53_559/image132.gif

Hint

Factor.

Step 2

Factor the numerators and the denominators.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_53_559/image133.gif

Hint

Divide out common factors.

Step 3

Divide out common factors.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_53_559/image134.gif

Hint

Simplify.

Step 4

Simplify.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_53_559/image135.gif

Multiply the numerators and multiply the denominators.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_53_559/image136.gif

**Problem: 59  Set: Exercises  Page: 194**

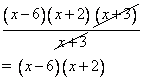
Look in your textbook for this problem statement.

Hint

Divide out common factors.

Step 1

Divide out common factors.



Therefore the two expressions appear to be the same.

Hint

Identify all values of *x* for which the rational expression is undefined.

Step 2

The second expression is defined everywhere. Identify all values of *x* for which the rational expression is undefined.

Hint

Determine the values of *x* for which the denominator is 0.

Step 3

Determine the values of *x* for which the denominator of http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_59_560/image153.gifis 0.

*x* + 3 = 0 if *x* = –3.

Therefore, the denominator is 0 for *x* = –3.

Hint

Compare.

Step 4

The first function is undefined for *x* = –3, while the second function is defined everywhere.

As we saw above, the two functions are equal wherever they are both defined, that is, for all *x* except *x* = –3.

**Problem: 61  Set: Exercises  Page: 194**

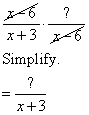
Look in your textbook for this problem statement.

Hint

Divide out common factors from the left side.

Step 1

Divide out common factors from the left side.



Hint

Equate to the right side.

Step 2

Equate to the right side.

http://hotmath.com/help/solutions/holliday210/9/1/Exercises/holliday210_9_1_Exercises_61_560/image156.gif

Hint

Multiply.

Step 3

Multiply.

? = (*x* – 2)(*x* + 3)

The missing value is (*x* – 2)(*x* + 3) or *x*2 + *x* – 6

**Problem: 65  Set: Exercises  Page: 194**

Look in your textbook for this problem statement.

Hint

Explain when a rational function is undefined.

Step 1

Division by zero is undefined. So, a rational function is undefined for those values of *x* for which the denominator is 0.

Therefore, the expression is undefined when 4*x* = 0, or when *x* = 0.

Hint

The same holds for the simplified function.

Step 2

For the simplified function to be equivalent to the original, the same restrictions on *x* should hold.

Therefore, the new expression is also not defined for *x* = 0.